

REMARKS

Claims 1-13 remain in the application. Claims 1 and 2 have been amended to correct the Markush group language and claim 1 has been amended to replace the semi-colons in the claim to commas.

Applicant urges the Examiner to enter the above amendments because:

a) The amendments place the application in better condition for allowance or appeal.

b) The amendments respond to rejections based on formal matters under 35 USC

112

made for the first time in the Final rejection and thus this is the first opportunity for applicant to make these amendments.

c) The amendments do not raise new issues requiring further search or substantial time to review.

The claimed invention is a nonwoven fibrous mat having a basis weight in the range of about 50 – 225 gms/sq./m and in which the fibers in the mat consist essentially of polymer fibers, the polymer fibers being bound together with about 16-30 wt. percent of a formaldehyde containing polymer resin latex binder of particular types that excludes phenol formaldehyde and a bisulfite compound in an amount of 1.25 wt. percent up to about 7.5 wt. percent, the latter additive providing excellent hot strength in the mat, at 200 degrees C., of no more than about 1 percent elongation, in the machine direction and low formaldehyde emissions as shown in Table 2.

Claim 1 was objected to because of the presence of several semi-colons where commas should have existed, and as containing improper Markush language. The reasons for this objection is corrected by the above amendment to claim 1.

Claims 1-13 stand rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement, the Examiner urging that the specification does not provide any teaching of fibers consisting essentially of polymer fibers. This rejection is traversed. The term "the fibers consisting essentially of polymer fibers" means, in well established usage of "consisting essentially of" that the fibers in the mat contain only polymer fibers and possibly other trace, contaminate, or incidental things having no material effect on the characteristics of the inventive mats. The specification, in describing the claimed mats, describes the fibers in the mats only as being polymer fibers, e.g. see the first paragraph of page 1, the first sentences of the first and second paragraphs of the Summary of the Invention, the second sentence of the first paragraph of the Detailed Description of the Invention and the paragraph immediately preceeding Example 1. This commonly used term, "consisting essentially of" was inserted into claim 1 to avoid an allegation that the fibers in mats were not essentially limited to polymer fibers. Applicants believe that the specification provides adequate written description for "the fibers consisting essentially of polymer fibers" as required by 35 USC 112, first paragraph, and according to the long established usage of "consisting essentially of" and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 1-13 stand rejected under 35 USC 112, second paragraph as being indefinite because of;

a) It is urged that "the fibers in the fibrous mat" lacks antecedent basis. While the word "fibrous" is believed to provide antecedent basis for "the fibers", nevertheless, the above amendment deleted the word "the" before fibers.

b) Improper Markush language in claims 1 and 2. This has been corrected by the above amendment.

Claims 1 -13 stand rejected under 35 USC 103 as being unpatentable over Chang et al in view of Taylor et al. The Examiner states that Chang et al teaches a polymer fiber mat in which the binder bonding the fibers together is a formaldehyde latex binder of the type recited in claim 1. The Examiner further states that Taylor et al teaches urea or phenol

formaldehyde binder compositions for bonding fibers together and includes a bisulfite, such as ammonium sulfite, to lower formaldehyde emissions and that it would have been obvious in the sense of 35 USC 103 to have used the bisulfite taught by Taylor in the binders taught by Chang. This rejection is respectfully traversed. Chang does not teach or reasonably suggest the claimed invention, and the teachings of Taylor do not reasonably suggest modifications to the Chang teachings to arrive at the presently claimed mats invention.

Chang et al teach using a thermosetting urea formaldehyde resin modified by the addition of water soluble styrene-maleic anhydride copolymer based binder for mats whereas the claimed invention does not contain a urea formaldehyde based binder, but instead contains a thermoplastic binder, the binder being a formaldehyde fortified polymer, the polymer selected from the group consisting of ethylene-vinyl acetate copolymer, styrene-acrylic copolymer, vinyl-acrylic copolymer, styrene-butadiene-acrylonitrile copolymer, acrylic copolymer prepared by emulsion polymerization of one or more acrylic ester monomers including ethyl acrylate, methyl acrylate, methyl methacrylate, butyl acrylate, 2-ethyl hexylacrylate, hydroxyethyl acrylate, hydroxypropyl acrylate, and hydroxyethyl methacrylate; acrylamide or substituted acrylamides, butadiene, styrene, acrylonitriles, vinyl acetate or other vinyl esters; carboxylic acid monomers or ethylenically unsaturated anhydrides capable of generating carboxylic acids. The claimed mats do not contain urea formaldehyde.

Taylor et al teach making a fiber glass insulation batts, col. 8, lines 36-37, by adding a bisulphate to a urea modified, phenol formaldehyde resin binder and spraying that binder onto hot glass fibers about 12 inches below a spinning machine used to make the fibers, and the binder just described. The fiber glass product made in the Examples of Taylor et al are insulation batts, note the "recovery" data and explanation in col. 8, lines 25-26 and 31-34. This is a very different product than the polymer fiber mats of the present invention, mats having hot strengths suitable for making roofing products in which the mats are subjected to hot asphalt up to about 200 degrees C. while being run through a manufacturing line at high speeds, see Table 1 and page 7 through page 8, line 31. Nothing in Taylor et al teaches or reasonably suggests using the kind of formaldehyde containing binders of claims 1 and 2 containing a bisulphate to make polymer fiber mats for making asphaltic roofing products, nor does Taylor et al teach or reasonably suggest using as much as 16 wt. percent binder in his glass fiber insulation. As described above, verified by the testimony of Michael Fay, an

expert in fiber glass wool insulation products and processes, in the Rule 1.132 Declaration, and further verified by the Exhibit, pages 24-27 of FIBER GLASS BY Mohr and Rowe, the fiber products taught by Taylor et al contain completely different types of fiber, very different amounts of very different binders.

For these reasons, there is no reasonable teachings or suggestions in either Chang et al or Taylor et al that would lead one of ordinary skill in the art to modify the products taught by either Chang et al or Taylor et al to achieve the presently claimed nonwoven mat products having the compositions and properties recited in the claims. The combined teachings of Chang et al and Taylor et al do not produce the claimed invention. Applicant respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claim 2 was rejected under 35 USC 103 as being unpatentable over Chang et al in view of Taylor et al as applied to claims 1 -13 above and further in view of the disclosure of Hummerich et al. The Examiner urges that Hummerich et al teaches that it is known to use acrylic copolymers and styrene in binder compositions including formaldehyde and therefore it would have been obvious to have used the binders disclosed in Hummerich et al in the processes and products taught by Chang et al and Taylor et al. This rejection is traversed for the same reasons given above for Chang et al and Taylor et al and further because Hummerich et al teach formaldehyde free binders, do not teach the binder used in the polymer fiber mats of claim 2, nor does Hummerich et al provide any motivation or reason to modify Chang et al and/or Taylor et al as the Examiner urges would be obvious. By teaching formaldehyde free resin binders Humerich et al teaches away from the claimed invention. This rejection appears to be one of hindsight after having the benefit of applicant's disclosure, and such is improper. For these reasons, applicant believes that claims 1-13 are patentable under 35 USC 103 and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 8-10 stand rejected under 35 USC 103 as being unpatentable over Chang et al in view of Taylor et al for the reasons given in the rejection of claims 1-13 above and further in view of Nishibara et al. The Examiner states that Nishibara et al teaches that SBR and acrylonitriles are well known common rubbers for polymer fibers (col. 2, lines 20-65 and that it would have been obvious in the sense of 35 USC 103 to have used SBR acrylonitrile

fibers in place of polyester fibers taught by Chang et al. This rejection is respectfully traversed. Claims 8-10 relate to the binder, not the polymer fibers, and require that the binder is a formaldehyde containing or fortified (dependent on Claim 1) emulsified styrene butadiene acrylonitrile copolymer latex. Nothing in Nishibara et al teach or reasonably suggest modifying Chang et al to produce the claimed nonwoven mats. Nishibara et al begins with a fiber reinforced resin sheets well known and widely used, col. 2, lines 9-11 and col. 6, lines 18-34 (containing 45 wt. percent resin) and did not teach or reasonably suggest a nonwoven mat as claimed in claim 1. Instead, Nishibara et al teach laminating such well known fiber reinforced resin sheets with a layer of thermoplastic sheet on each side of the fiber reinforced resin sheet and then passing the laminate between heated rollers and a stretching device to produce thin sheets having an even higher, but undisclosed resin content. Nishibara et al do not teach making the kind of mats taught by Chang et al, and do not teach or reasonably suggest modifying Chang et al to remove urea formaldehyde from the binder or to make nonwoven mats having a binder content of 16-30 wt. percent.

For these reasons applicant believes that claims 8-10 are patentable under 35 USC 103 and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Applicants believe that the claims are now in condition for allowance and look forward to receiving a notice of allowance. However, if the Examiner believes one or more issues still exist, to expedite disposal of this application, the Examiner is respectfully invited to call Applicants' attorney at the number listed below to discuss the issue or issues and a way of removing.

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Respectfully submitted,


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